MONTHLY WEATHER REVIEW,

MAY, 1877.

WAR DEPARTMENT,

Office of the Chief Signal Officer,

DIVISION OF

TELEGRAMS AND REPORTS FOR THE BENEFIT OF COMMERCE AND AGRICULTURE.

INTRODUCTION.

The present REVIEW for the month of May depends upon all data received up to the 15th of June from the Canadian Meteorological Service, the United States Signal Service and Voluntary Observers, the Army Post Surgeons and the United States Navy. The most interesting features of the month have been:

First, The remarkably high temperature from the 18th to the 24th;

Second, The heavy rain-fall west of the Mississippi and the drought in California; also the light rains in the Lake region, and the forest fires in Michigan and New York;

Third, Injury done to grasshoppers in the West and Southwest by cold and rainy weather;

Fourth, The earthquake of Iquique, and the ocean wave resulting therefrom, also similar wave on the 15th on Lake Erie;

Fifth, The aurora of the 28th; and,

Sixth, Tornadoes and hail-storms in New York and New England on the 18th.

BAROMETRIC PRESSURE.

In General.—The general distribution of atmospheric pressure is shown by the isobars upon chart No. II; these present no marked resemblance to those of May in any of the preceding five years but agree better with the average or normal values. The barometric pressure has been decidedly low at the Rocky Mountain stations and in Oregon. By comparison with a chart of average mean pressures for May for the years 1872 to 1876, inclusive, it will be seen that during the present month the isobar of 30.00 has extended northward over the Lake region, or 12° of latitude north of its average position in Tennessee and Virginia. The area of pressures lower than 29.85 has, during the past month, been well developed on the eastern slope of the Rocky Mountains, and the same isobar crosses New Brunswick and Nova Scotia at an unusual distance inland. Barometric pressures have, therefore, been below the average in northern New England and the Canadian Provinces, but above the average in the Lake region.

Barometric Range.—The general range of the barometer over the whole country east of the Rocky Mountains was about 1.25 inches, as may be seen from the following table, which gives the maximum and minimum pressures that occur on the tri-daily maps (7:35 a. m., 4:35 p. m. and 11 p. m., Washington time,) near the centres of the respective areas of high and low barometer:

LOW AREAS.				HIGH AREAS.			
No.	Location.	Date.	Minimum Barometer.	No.	Location.	Date.	Maximum Barometer.
I.	Gulf of St. Lawrence	May 3rd, 4:35 p. m.	29.24	I.	Texas	May 1st, 7.35 a. m.	30.10
II.	Tennessee	May 3rd, 4:35 p. m.	29.70	II.	Manitoba	May 7th, 7:35 a. m.	30.25
III.	Texas	May 3rd, 4:35 p. m.	29.65		Lower Lakes	May 12th, 7:35 a. m.	30.40
IV.	Dakota	May 5th, 7:35 a. m.	29.44		South Atlantic States	May 15th, 7:35 a. m.	30.40
V.	Ohio valley	May 5th, 7:35 a. m.	29.65	III.	Manitoba	May 24th, 7:35 a. m.	30.37
VI.	Ohio valley	May 7th, 4:35 p. m.	29.67		Middle Atlantic States	May 28th, 7.35 a. m.	30.35
	Halifax	May 10th, 7:35 a. m.	29.69				
VII.	South Atlantic coast	May 7th, 11 p. m.	29.68				
VIII.	Manitoba	May 15th, 4:35 p. m.	29.55				
IX.	Minnesota	May 17th, 4:35 p. m.	29.37				
X.	Key West, Fla	May 17th, 4:35 p. m.	29.84				
XI.	Minnesota	May 25th, 11 p. m.	29.27				
XII.	Minnesota	May 31st, 4:35 p. m.	29.15				

The greatest local barometric ranges have been as follows: Bismarck, 1.29 inches; Breckenridge, 1.14; North Platte, 1.12; Yankton, 1.05; Duluth, Eastport and Mt. Washington, 1.01. *The smallest local barometric ranges* have been: Key West, 0.25; Santa Fe, .38; Galveston, .48; Indianola, .49; Cairo, Vicksburg and Salt Lake City, .50.

Ares of High Pressure.—No. I.—On the first day of May the pressure was highest over the Gulf States, and on the 2d extended thence northward to the Lake region, after which it subsided, drawing eastward to the Atlantic, and was followed by a very general depression. Heavy damaging frosts were reported on the morning of the 2d in central and southern Illinois.

No. II.—On the 6th, in the morning, rising barometer, with cooler northerly winds, pressed southward over Canada and the Lake region, and by the 7th, in the morning, the barometer had risen 0.35 in Manitoba, and was high from Dakota to the St. Lawrence valley. From this time on the pressure began to diminish slowly. On the 9th, in the morning, the area of highest barometer extended from the Upper Lakes southward to the Gulf of Mexico, and so continued until the morning of the 11th, at which time an area of 30.25 prevailed over Canada, the Lake region, Middle and South Atlantic States. The barometer rose slowly over this entire region, as also over New England during the next twenty-four hours, and on the 12th, 7:35 a. m., an area of 30.40, covered Upper Canada. This marked southeastward extension of the area of high pressure probably was also connected with a storm-centre still farther southeast, since the Marine Reports show on the 12th a heavy NE. gale, lasting 48 hours, in lat. 24° 38′, N., 65° 30′, W. The pressure now diminished slightly, and on the 14th, continued highest from Upper Canada to the South Atlantic coast, but had fallen decidedly in New England and west of the Mississippi. During the next twenty-four hours the barometer rose in the South Atlantic States, but fell elsewhere, and on the 15th, 7:35 a. m., the area of 30.40 covered the Carolinas, where it remained central, with slowly diminishing pressure, until, on May 21st, 7:35 a. m., it had disappeared, with the barometer at 29.90 to 95, which pressure was about the highest exhibited on that map, and appears to have prevailed over the entire Gulf of Mexico and Gulf States.

No. III.—The barometer rose rapidly in Dakota on the 21st, following in the rear of storm No. XI, and on the 22d, 7:35 a. m, the highest pressure 30.22, was reported in Manitoba. This area extended southward over the Mississippi valley, and on the 23rd, 7:35 a. m., the pressure of 30.35 prevailed north of Lake Superior and Minnesota, with a northerly gale in the Upper Lakes. The area of rising barometer continued extending south and east, during the 23d, 24th and 25th, and on the morning of the 26th, the highest pressure, 30.26, was central over the Upper Lake region, whence it moved slowly southeastward, and on the 27th, 7:35 a. m., the area of 30 22 was central in the Ohio valley. This area now advanced eastward, and the central pressure now rose decidedly, so that on the 28th, 7:35 a. m., the area of 30.35 was central in Maryland, and on the 29th, in the morning, the pressure of 30.30 prevailed off the New Jersey coast. The central highest pressure continued over the Middle Atlantic States during the 29th and 30th, but the barometer fell steadily here, as it did, in fact, throughout the whole country, while the formation of low pressure, No. XII, was in progress. The area of 30 10 was central on the morning of the 31st over the Carolinas, but the pressure rose during the rest of the 31st, in the Gulf States, as soon as low barometer No. XII began to move northeastward, and on June 1st, 7:35 a. m., the highest pressure, 30.22, was over North Carolina.

Areas of Low Pressure.—But few well-defined areas of low pressure are charted upon map No. I. since, out of the twelve that are mentioned in the text, only the tracks of five could be satisfactorily given. Most of those that are charted lie somewhat southward of the average positions in former years. Their history in detail is as follows:

No. I.—First appears some distance off the New England coast, on the morning of the 1st, and during the 2d rapidly assumed the proportions of a severe cyclone, which seems to have passed northward over Labrador. The report of heavy NNW. gales for three days preceding May 1st, at the Bermudas, suggests that this cyclone must have moved slowly northward, passing a little to the east of those islands.

No. II.—This depression originated on the 2d in Kansas and Texas, whence it passed eastward, and was dissipated on the 3rd in the Ohio valley.

No. III.—This depression had the same origin as No. II; but in its eastward course kept near the Gulf coast, and was dissipated on the 4th in the East Gulf States.

No. IV.—This depression appears on the 4th and 5th, extending from Manitoba southeastward over the Nothwest, very generally accompanied by light rains. As it extended southward the rain-area extended over the entire Gulf States and the Ohio valley, giving rise to several centres of slight depression.

No. V.—The very general rains that prevailed in the Gulf and Atlantic States on the 4th and 5th gave rise, as aforesaid, to several slight depressions, one of which, No. V, moved eastward over the Alleghanies on the 5th. This storm has been charted as though it continued its course east of the Atlantic course and subsequently developed in the severe storm which was off the Nova Scotia coast on the 7th. The Marine Reports, however, make it likely that No. V, after crossing the Alleghenies on the 6th, united with the tornado that passed over St. Marks, Fla., at 2 p. m., and subsequently with a severe storm then existing over the Gulf stream. Thus, reports from lat. 35° 53′ N., 68° 19′ W., show that a destructive SW. hurricane prevailed in that locality on the 6th.

No. VI and VII.—The general depression which prevailed during the 5th west of the Mississippi extended somewhat eastward during the 6th, and is considered as the origin of low barometer No. VI. This was on the morning of the 7th central in Illinois and Indiana, and on the afternoon central in southern Ohio, at which time also a second depression (No. VII) was developing off the South Atlantic coast, and a third off the New England coast, which latter it may possibly be proper to consider as a continuation of storm No. V. The two areas, No. VI and VII, merged into one on the 9th, which was central at 11 p. m. of the 8th off the North Carolina coast. During the 9th, its course was apparently northeastward towards Nova Scotia, along the coast of which province it passed on the 10th, and then disappears from our chart. There was at this date a severe storm in the southern part of Great Brittain, but as no other storm-centre appears on the European Weather Maps until the 16th, it is probable that storm No. VI did not advance to Europe.

Nos. VIII and IX.—West of the Mississippi the barometer continued low during the greater portion of the time from the 9th to the 16th; but this condition, which is the normal one for this region at this time of the year, gave rise principally to local storms, (on the 11th at Brownwood, Texas, a destructive rain and hail-storm; on the 16th, tornado at Fulton, Mo.,) which, increasing day by day in severity, finally culminated in a heavy rain-fall and local storm in eastern Kansas on the 16th, and the small depression, No. IX, which, starting on the 15th in northern Dakota, stretched along the northern limit of our maps and on the 18th appears as a well-defined area of low pressure central in the St. Lawrence valley; it moved thence southeastward over Nova Scotia and disappeared on the 19th. When central, on the 18th, in the St. Lawrence valley the warm SW. winds that prevailed over New England and New York were attended by severe local storms as follows: Violent hail and thunder at Stanstead, Vt., and in northwestern Rhode Island; tornadoes near Quebec, at St. Hippolyte, Can., and Stuyvesant, N. Y. The most violent of these tornadoes passed to the north of the latter; its track is traced from Saratoga county southeastward through Argyle, in Washington county, N. Y., to Shaftsbury, in Bennington county, Vt.

No. X.—The barometer fell decidedly during the 16th and 17th in southern Florida, while an area of high pressure extended eastward over the South Atlantic States. The heavy rains and brisk winds seemed to show that a slight disturbance advanced westward over the Gulf of Mexico from that date to the 19th; but no definite track of its course can at present be given.

No. XI.—The permanent low pressure on the eastern slope of the Rocky Mountains culminated on the 19th in the formation, in Dakota, of a progressive area of low pressure, which was central on the morning of the 20th in eastern Dakota, but in the afternoon in southern Minnesota; it passed slowly northeastward over the Upper Lake region, being central in the afternoon of the 21st in Wisconsin, then stretched eastward over the Middle States and New England, and was on the morning of the 22nd central near Long Island. The first part of the course of this area of low pressure was as usual southeastward down the Missouri valley, and floods were produced on the 20th and 21st in the Missouri and Kansas rivers. Very destructive tornadoes on the 20th passed over Marion, Ind., and Blackearth, Wis.

No. XII.—An area of high pressure occupied the Lake region and Mississippi valley during the rest of the month, but on the 27th the pressure began to diminish west of the Mississippi, and from the 28th to the 31st a well-marked area of low pressure remained permanently central in Dakota, with steadily diminishing central pressure, and on its south and east sides an increasing area of brisk and high southerly winds and local rains, (amounting sometimes to incipient tornadoes at Sioux City, Iowa, and St. Paul, Minn., on the 30th, and in Lafayette county, Mo., on the 31st.) On the afternoon of the 31st the central area, whose pressure had fallen to 29.15, began moving eastward into Minnesota, and probably disappeared during the first few days of June in British America.

Vessels experiencing storms at sea.—The following notes relating to storms at sea have been received: On the 1st, heavy NW. gales for three days off Bermuda, probably the same as storm No. I; on the 6th a destructive hurricane from the SW. was experienced in lat. 35° 53′ N., long. 68° 19′ W.; on the same date, in same latitude, heavy NW. gale, possibly the same as storm No. V; on the 12th heavy NW. gale for 48 hours in 24° 38′ N., 66° 30′ W.; on the 16th strong S. and ESE. gale in 27° 32′ S., 49° E.